**Primary Design & Technology in Wandsworth**

Thoughts from Subject Coordinators

This short pamphlet summarises the work of design & technology subject coordinators from the following schools:

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| --- |
| All Saints |
| Brandlehow |
| Falconbrook |
| Gatton |
| Granard |
| Heathmere |
| Honeywell Jnr |
| John Burns |
| Sellincourt |
| Smallwood |
| St Michael's |
| Westbridge |

They explored the requirements of the new programme of study for design & technology due to be introduced to schools in September 2014. The advice and guidance given in this pamphlet builds on current good practice and extends this providing a) key questions that you should ask yourself concerning pupils designing and making and b) possible examples of activities that can support this with short commentaries.

We hope the pamphlet will help you devise challenging and rewarding learning journeys in design & technology for the pupils in your school.

The pamphlet also provides addresses of some useful websites and email addresses and, courtesy of Mary Walsh of the Merton Primary Curriculum D&T Workshop, a useful D&T skills passport plus details of the new statutory requirements. We hope you will find it useful.

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*David Barlex* (D&T Course Leader)

**Contents**

Key Questions page 2

Possible Activities page 3

Useful Websites and email Addresses page 7

Appendix 1 Page 8

A D&T Skills Passport

Provided by Mary Walsh

Appendix 2 Page 10

Statutory Requirements for Design & Technology Key Stage 1 and Key Stage 2

**Key Questions**

Whenever pupils are designing and making it is important that their work is underpinned by the ‘Three S’ approach. The item being developed should be:

**SOMETHING** … For **SOMEBODY** … In a **SITUATION**

This leads us to ask the following questions

Concerning the SOMETHING

* Are the pupils clear about the sort of product they will be designing and making?
* Do they understand the sorts of things it must do to work well?
* Do they know enough about ways to achieve this ‘working well’?
* Do they know what resources are available to them?
* What are the materials, ingredients, components, and tools they will be able to use?
* Where can they go to find ideas that will help them be original?

Concerning the SOMEBODY

* Do the pupils know who will use the item they are designing?
* It could be a baby, another child of their age, someone a little older, or an adult or an elderly person.
* Do they know what that person will want from the item?
* How can they find out what that person might want from the item?

It will be important for pupils to have the opportunity to discuss and research the needs of the user.

In thinking about the needs of the user the pupils should ask and answer the following sorts of questions about their intended design

* What appearance will please or interest the user?
* How can I make sure my product will be different or out of the ordinary?
* What about the shape, the colour, the size?
* What parts need to ‘work’?
* Will the user be able to manage these working parts easily?

Concerning the SITUATION

* Where will the item be used?
* Will this make a difference to what it is like or what it is made from?
* Will the item need to be stored?
* Will it need to be kept safe?

By using the ‘Three S’ approach you can enable your pupils to produce items that are genuine responses to meeting peoples’ needs and sufficiently different from one another to show individuality and creativity.

However there are times when it is valuable for pupils to engage in activities other than a complete designing and making activity with a user focus. There is much useful learning to be had from construction kits, technical challenges that require problem solving; making something that someone else has designed. All these as well as user focused designing and making will be considered in the next section.

**Possible Activities**

We start this section with three points of caution

**1. Why we teach design & technology**

Design & technology is often justified in terms of the other subjects it helps pupils learn, such as improving mathematics or literacy skills. This may be true but it is not why schools teach design & technology. No one would dream of justifying the teaching of history on the grounds that it helps learners understand mathematics and English. History is taught as a subject that is worth learning in its own right. So it is with design & technology.

Imagining what might exist in the future and using tools and materials to create and critically explore that future is a unique human ability which has led to the development of successive civilizations across history. Such activity embodies some of the best of what it means to be human. Learners study design a& technology because it introduces them to this field of human endeavour and empowers them to become people who see the world as a place of opportunity where they and others can, through their own thoughts and actions, improve the world in which they live. And this starts in primary school.

**2. The place of design & technology in cross curricular themes**

Many primary schools are devising their curriculum around themes with particular subjects contributing to those themes according to the specialist knowledge taught by those subjects. It is very important that the design & technology contribution to thematic work accurately reflects what needs to be taught and learned in design & technology. The use of, for example, model making to illustrate historical artefacts or the features of different landscapes is a useful educational activity but falls far short of what is required in the learning of design & technology.

**3. Devising the learning journey as a set of products**

One way to think about pupils’ learning journey in design & technology is to conceive it as a sequence of different types of products that they design and make. This can be a useful approach as it allows us to decide on, for example, the range of tools and materials pupils will learn to use as they move through the sequence. As the products become more complex successful designing should involve using more demanding technical knowledge. But it is important that there can be variation in individual pupil’s responses. In all the following suggestions it will be important to use the Three S approach to meet this requirement.

**Some product based designing and making activities**

*Designing and making packaging*

The following example was seen as a very useful activity to introduce rapid modeling to pupils. The group felt it captured the essence of designing and making in a very immediate way – taking action with simple materials and tools to produce a novel and useful item.

Design and make a container to hold 8 marbles.

You have these materials and tools

One sheet of A4 card

One 45 cm length of masking tape

Scissors

You should be able to lift the container holding the marbles off the table without the marbles falling out

The container holding the marbles should be able to stand on the table without falling over

You should use your imagination to make your container design unusual

There are elements within this task that meet requirements for design, make, evaluate and technical knowledge in the new PoS.

Interestingly this task can be used as a pre cursor to a more extensive task in which the activity is embedded in a particular context and requires the development of a container that meets more criteria- as follows perhaps:

There is going to be an inter school marble competition, held in the Town Hall. You and your team will need to be able to carry your marbles to the competition. Hence each team member will need a container in which to transport his/her marbles. Use what you have learned in the preliminary exercise to design and make a set of marble containers for your team. It should hold eight marbles and express the identity of the team and individual player*.*

Clearly a all sorts of items need to be packaged for a variety of reasons so it is not difficult to have examples of packaging that make different demands on design & technology learning. Packaging that has to protect as well as hold and present provides an additional challenge.

*Designing and making puppets*

Puppets can be very simple as in finger or sock puppets, more complex as hand puppets and much more complex as string controlled marionettes. The theatre, scenery and props needed for a performance plus the provision of lighting and sound effects can provide demanding design & make activities. Mounting a performance including the production of a programme and refreshments for the audience extends the learning. Writing the story to be acted out by the puppets enables useful English work.

*Designing and making cards and books*

Moving picture, pop up cards and pop up books provide an interesting range of products the require pupils to learn about and use aesthetics and mechanical control. Such work can be extended to include electrical control by the inclusion of simple circuits operated by membrane switches. As with puppets the narrative of the cards and books can be developed through work in English

*Designing and making lighting*

Developing different sorts of lights that can be used in particular situations presents pupils with a wide range of challenges: technical, constructional, aesthetic and user interface.

They will need to think about what the light will be used for and who will use it. This will inform how brightly it should shine and the sort of switches to use and where they should be placed. Circuits to provide and control the lighting will need to be designed and these will need to be contained in a way that is both robust to enable use and appealing to the user.

*Designing and making carriers*

Stiff paper carrier bags are deceptively simple. They usually have an advertising function as well as a carrying function. Sometimes the handles are simply holes in the side of the carrier, sometimes they are formed by having sides of a particular shape, sometimes they are separate additions to the main bag. How these handles are joined to the bag can vary. The paper and structure of the bag needs to be strong enough to hold what is carries without tearing. How strong this is will depend on what is to be carried and this in turn will also affect the size of the bag. What a lot of decisions to make and some of these decision can be informed by scientific investigations into materials and structures. Sometimes a carrier bag can be made from a single sheet of paper – and that can be an added challenge. And of course there are all sorts of carriers in addition to carrier bags made from paper

*Designing and making food products*

It is important that the conditions for designing and making food products are clean and that pupils are well instructed in safe, hygienic food handling skills. It is important that their work with food in design & technology involves more than simply following given recipes although such recipes may of course be modified in response to users needs and wants. Typical food products that pupils can design & make which can vary according to the intended user are: fruit salads, toast, cold drinks, hot drinks and simple pizzas or tarts.. Devising healthy packed lunches provides pupils with the opportunity to develop a meal as opposed to a single product. Some primary schools work with local secondary schools designing and making different sorts of bread .

*Designing and making furnishings*

Primary school pupils can design and make simple cushions and wall hangings and there are interesting possibilities for developing skill in surface decoration, simple textile construction and researching and responding to user preferences. Asking pupils to think about who might want a particular furnishing, what that person might want the furnishing to look like and how this related to the place where the furnishing was to be placed are challenging questions. If pupils are supported in answering these questions through discussion with possible users then the resultant designing and making constitutes good design & technology.

*Designing and making moving toys*

Pupils can begin designing and making moving toys through found material modeling in the Foundation Years. But as they move through primary school this work becomes more sophisticated as pupils learn more about mechanical and electrical control culminating in the designing and making of an electrically powered toy that moves along complete with light and sound effects. This work can be extended to include programming electrical toys that have been built using LEGO (or similar) and incorporating a processor that can be programmed. Of course some moving toys are much simpler and there opportunities for pupils to design moving toys that rely solely on mechanical control, utilizing a cam for example to achieve rise and fall. In all such cases it will be important to consider what the user will want from such toys. And there are interesting opportunities with toy kites and parachutes. It’s difficult for young pupils to design the structure of a kite but they can certainly explore and make different sorts of kites and decorate them in interesting ways. Parachutes however are a different matter and there are interesting opportunities to design parachutes that maximize ‘fall time (i.e. minimize dropping speed) perhaps as an ‘adventure accessory’ for various dolls or toy figures.

**Considering places as starting points**

In the above activities the teacher had decided th product to be designed and made although there was considerable scope of pupils to be creative and develop their own original variations. It is possible to provide pupils with a suggested place and ask what might be needed in that place. Pupils can then respond by making or modeling different sorts of products according to their particular interests. This is more difficult to manage but it does give the pupils more ownership of their designing and making. Of course it is important that the pupils are guided to some extent so that their ambitions are neither trivial nor over elaborate and do require the use of appropriate design & technological knowledge and skill. Possible places include:

The school playground

The school bus stop

The school dining hall

The local park

The school entrance

It is possible to give this a time travel twist and ask pupils to use what they have learned in history to describe what life was like in a particular time and place in the past and devise items that might be of use to people who lived then. This will need to be managed carefully if it is not to regress to simple historical model making.

**What about just making?**

There are occasions when pupils can learn a great deal simply by making something someone else has designed. For example giving pupils nets of a cube, tetrahedron, pyramid etc and teaching them how to cut out, score, fold and assemble into 3D objects is a worthwhile activity that will pay dividends in design and make activities that require the production of any sort of shell form. Assembly of mechanisms from kits of parts can be the first step to understanding what those mechanisms do and how they do it. Producing samples of knitting or weaving will help pupils become dexterous and understand the structure of fabrics. Such activities do take time especially if they require repetition to achieve a skill. Hence some teachers recommend running a lunch time ‘making’ club to develop skills that require more practice time than can be achieved in normal class time.

**Including technical challenges**

There is much to be learned through technical problem solving such as building bridges and towers from fragile material such as uncooked spaghetti or thin paper. Often a competition element can add to pupil motivation – whose tower is the tallest; whose bridge can take the greatest load. Such work involves ‘devising fair tests’ and can be put into context by considering the purpose of such items and how their design in the world outside school has changed over time. Often in such work it is possible to add an extra dimension of challenge by organizing a shop in the classroom, managed by a TA, from which pupils ‘buy’ their materials and components having been given a limited budget.

**Learning about some BIG picture ideas**

It is very easy for the experience of learning design & technology to be seen by the pupils as somewhat fragmented and for their overriding impression of their learning to be that of making. This is understandable as for them it may well be that this is the feature which distinguishes the subject fro others in the school timetable. There is a case to be made for using pupils’ learning in design & technology, admittedly often and deliberately practical in nature to develop knowledge and understanding about BIG or enduring ideas in the subject. Ideas such as:

* Materials have properties and sources and we choose them accordingly
* How things can be made
* How things work
* The way technology works

An important aspect of your curriculum will be introducing your pupils to such ideas.

**Useful Websites and email Addresses**

Wandsworth Primary National Curriculum 2014 wikispace

<http://primarynationalcurriculum2014.wikispaces.com/home>

This website shared by David Barlex with Torben Steeg contains free to download units of work from the Nuffield Design & Technology Project plus some primary case studies

<http://dandtfordandt.wordpress.com/resources/nuffield-primary-dt-resources/>

Technology Supplies provide a range of useful primary d&t resources

<http://www.technologysupplies.co.uk/primary.html>

TTS provide a wide range of useful primary d&t resources

<http://www.tts-group.co.uk/shops/tts/Catalogue/Design-Technology/7b43fc87-19be-4f11-be29-8f1535327b71>

Although based in the US this site provides very useful resources ands lots of ideas

[www.kidsinvent.com](http://www.kidsinvent.com)

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**Appendix 1**

**What can I do in DT?**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **I can statement**  Beginner; Improver; Intermediate; Skilled; Advanced | **Self**  **assessment** | **Someone else’s assessment** |
| **Cutting Skills** | I can cut fabric and card using scissors to the nearest centimetre. |  |  |
| I can use a knife safely to cut food. |  |  |
| I can use scissors precisely when cutting out, cutting within a centimetre. |  |  |
| I can cut to the nearest centimetre using a junior hacksaw. |  |  |
| I can use sharp scissors accurately to cut out textile materials. |  |  |
| I can make cuts with scissors and saws to the nearest half a centimetre. |  |  |
| I can make cuts (scissors, snips, saws) accurately and reject pieces that are not accurate and improve my technique. |  |  |
| **Joining Skills** | I can join fabrics using glue. |  |  |
| I can join materials together to make them strong. |  |  |
| I can join textile materials together using glue, staples, tying and a simple stitch. |  |  |
| I can join materials to make products using various fastenings. |  |  |
| I can create joins that are strong and stable, giving extra strength to my products. |  |  |
| I can join textiles using art skills of stitching, embroidering and plaiting to make a durable and desirable product. |  |  |
| **Construction/Production Skills**  **Level 3 contd.** | I can make a structure out of cardboard. |  |  |
| I can make a product that moves using a turning mechanism (e.g. wheels, winding) or a lever or hinge (to make movement. |  |  |
| I can make a product that uses movement. |  |  |
| I can score and fold to shape materials accurately. |  |  |
| I can make holes accurately (punch, drill). |  |  |
| I can make a product that uses electrical and mechanical components. |  |  |
| I can use suitable mouldable materials selected for the purpose of my product. |  |  |
| I can use both of my hands and other tools to mould materials into an accurate shape that will do the intended job. |  |  |
| I can plait or weave to create new products such as rope, belts, bracelets using textile products. |  |  |
| I can use a high degree of precision and do the intended job well (e.g. a handle on a cup is designed to be an insulator.) |  |  |
| I can use precise electrical connections. |  |  |
| **Marking out/Measuring Skills** | I can draw a suitable template to mark out fabric and card. |  |  |
| I can measure and mark out materials to the nearest centimetre. |  |  |
| I can weigh or measure ingredients. |  |  |
| I can measure out my ingredients by weight or quantity using scales where appropriate. |  |  |
| I can measure, score and fold to the nearest mm. |  |  |
| I can punch and drill directly where I have marked. |  |  |
| I can make very careful and precise measurements so that joins, holes and openings are exactly in the right place. |  |  |
| I can mark out using my own patterns and templates. |  |  |
| **Designing Skills** | I can talk about what I think my design should look like, how it should work and how it should be made. |  |  |
| I can give reasons for why my design should look like it will, work like it will and be made the way it will be. |  |  |
| I can make models to describe my design ideas. |  |  |
| I can change my design ideas to improve them. |  |  |
| I can make sketches with notes to describe my design ideas. |  |  |
| I can follow a Design Brief appropriate to the task and my age, taking into account for whom the product is intended. I am able to conduct suitable market research before making my product. |  |  |
| **Finishing Skills** | I can make sure my work is neat and tidy. |  |  |
| I can shape my product carefully using techniques and tools that lead to a quality finish e.g. using sandpaper. |  |  |
| I can ensure that my product has a good finish so that the user will find it both useful and attractive |  |  |
| I can apply high quality finish (e.g. using carving, paint, glaze, varnish or other finishes.) |  |  |
| I can carefully finish my products by adding extra appeal. This sometimes includes the addition of other materials. |  |  |
| I can ensure that the edges are finished by sometimes adding other materials (e.g. edging strips.) |  |  |
| **Evaluation Skills** | I can talk about whether I like or dislike a product. |  |  |
| I can give reasons why I like or dislike a product. |  |  |
| I can talk to someone about whether they like or dislike a product. |  |  |
| I can ask questions of someone to find out why he/she likes or dislikes a product. |  |  |

**Appendix 2**

Design & Technology in the National Curriculum November 2013

**Purpose of study**

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

**Aims**

Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world

Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users

Critique, evaluate and test their ideas and products and the work of others

Understand and apply the principles of nutrition and learn how to cook.

**Breadth of Study**

**KS1**

•Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making.

•They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

**KS2**

•Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making.

They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment

**Design**

**KS1**

•Design purposeful, functional, appealing products for themselves and other users based on design criteria

•Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

**KS2**

•Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups

•Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

**Make**

**KS1**

•Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]

•Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

**KS2**

•Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately

•Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

**Evaluate**

**KS1**

•Explore and evaluate a range of existing products

•Evaluate their ideas and products against design criteria

**KS2**

•Investigate and analyse a range of existing products

•Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

Understand how key events and individuals in design and technology have helped shape the world

**Technical Knowledge**

**KS1**

•Build structures, exploring how they can be made stronger, stiffer and more stable

•Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

**KS2**

•Apply their understanding of how to strengthen, stiffen and reinforce more complex structures

•Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

•Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

•Apply their understanding of computing to program, monitor and control their products.

**Cooking and nutrition at KS1 and KS2**   
As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

**KS1**

•Use the basic principles of a healthy and varied diet to prepare dishes

•Understand where food comes from.

**KS2**

•Understand and apply the principles of a healthy and varied diet

•Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed